

LATE-SUMMER FOOD OF RED-WINGED BLACKBIRDS IN A FRESH TIDAL-RIVER MARSH

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IN late summer, during molt, large numbers of Red-winged Blackbirds (*Agelaius phoeniceus*) feed and roost in marshland, and from there make forays into the uplands. Certain fresh tidal-river marshes in the Delaware Valley and Chesapeake Bay region where there are great beds of wild rice (*Zizania aquatica*) attract hundreds of thousands of redwings.

The period when wild rice seed is available coincides with the ripening period of a part of the corn (*Zea Mays*) crop. The availability of rice has been shown to reduce feeding pressure on corn. Robert T. Mitchell (1953. U.S. Fish and Wildlife Service unpublished report) found that in the lower Delaware River Valley damage was heavier in fields where corn matured before and after the wild rice than in those where corn ripened during the time the wild rice seed was available. The following year Mitchell and John T. Linehan reported (1954. U.S. Fish and Wildlife Service unpublished report) that damage to cornfields adjacent to marshland was three times as great as to comparable fields farther from marshland.

The importance of wild rice and other marsh plants to the redwing during the period when wild rice seed is available, was studied further in 1958 and 1959. Results are reported in the present paper. Field observations were made in wild rice beds in a 200-acre fresh tidal marsh on the Patuxent River near the mouth of Lyon's Creek, Anne Arundel County, Maryland (Fig. 1). Additional food-habits data were obtained by analysis of stomach contents of 130 birds collected while they were feeding in the marsh. Collections were made between 8:00 AM and 4:00 PM, from 5 August to 30 September. Birds that left the area before 8:00 AM or arrived after 5:00 PM were not collected because it was not possible to be sure that these birds were using the marsh as a feeding area.

THE PLANT COMMUNITY

The Patuxent River marsh is typical of the fresh tidal-river marshes of the coastal plain province. Similar marshes are located in the upper reaches of most coastal-plain rivers. They are characterized by the richest mixture of marsh flora of any of the major marsh communities in the Chesapeake Bay area.

Important plants in this community are wild rice, three species of smartweed (*Polygonum*), Walter's millet (*Echinochloa Walteri*), river bulrush (*Scirpus fluviatilis*), spatter-dock (*Nuphar luteum*), arrow-arum (*Peltandra virginica*), arrowhead (*Sagittaria latifolia*), pickerelweed (*Pontederia cordata*), marsh-



FIG. 1. Fresh tidal-river marsh, Patuxent River, Maryland. The dominant vegetation here is wild rice.

mallow (*Hibiscus* sp.), rice-cutgrass (*Leersia oryzoides*), water-hemp (*Amaranthus cannabinus*), and two species of cat-tail (*Typha latifolia* and *T. glauca*).

Seed production is at its peak during August and September. Rice seed is produced from about 15 August to 15 September; dotted smartweed (*Polygonum punctatum*) from mid-July to 30 October; and millet from about 15 August to 15 October. The seeds of halberd-leaved tearthumb and arrow-leaved tearthumb (*Polygonum arifolium* and *P. sagittatum*) are present in quantity after 1 September; and rice-cutgrass after 15 September.

FIELD OBSERVATIONS

Hordes of redwings begin to invade the Patuxent River marsh soon after the nesting season. This is in late July and about the time of the onset of molt. Wild rice towers over all other marsh plants and blackbirds frequently use it for perching. The wild rice is then in bloom and the birds occasionally eat the staminate flowers. This may be done while the birds search for seed which has not yet formed, for the flowers do not seem to constitute an important part of the diet. The marsh during this period may contain hundreds of redwings hovering in the air as they grasp the panicle or seed head of the rice plant in an attempt to loosen flower or developing seed.

The ripened rice seed is long, slender, cylindrical, and armed with an even longer and more slender awn and a thin hull covered with short stiff bristles. A feeding bird removes the hull by holding the seed crosswise and revolving it in its bill. Birds feeding on wild rice often acquire a greenish stain on the sides of their bills near the base.

As the wild rice and dotted smartweed reach optimum seed production the redwing nears the height of its molt and begins to restrict its activity. The population in the Patuxent marsh probably is at its maximum at this time. An estimated 50,000 birds were roosting there on 2 September 1959.

Although the marsh offers both a retreat and source of food, at least some of the birds do part of their feeding elsewhere. Throughout the period of wild rice availability, corn continues to show up in some gizzards. Also, some molting redwings, without tail and minus some flight feathers, were seen in labored flight to upland areas.

By the end of September, any remaining wild rice seed is embedded in the mud. By this time most birds have completed their molts. Some have begun to migrate and the great summer flocks have diminished in size.

Adults fed more commonly on wild rice in the Patuxent marsh than did juveniles. Of 130 redwings collected at random while they fed on rice, only 11 were juveniles or birds of the year. The same preponderance of adults was found among birds caught by mist-netting. There were only 40 juveniles among 300 redwings netted in daylight hours from 15 August to 15 September.

STOMACH ANALYSIS

Seeds of marsh plants formed the bulk of the food of redwings collected, (Table 1). Dotted smartweed, wild rice, and Walter's millet were the most important. Dotted smartweed occurred in 93 stomachs and comprised 38 per cent of the total volume of food in the series of 130 stomachs examined. Seeds of smartweed may have been utilized to a greater extent than seeds of other marsh plants because they were easily obtained and were available in greater quantities and over a much longer period than any other marsh seeds. Even during the optimum period of wild rice availability, the smartweed was utilized 15 per cent more than rice.

Other smartweeds, the large-seeded halberd-leaved tearthumb, and the arrow-leaved tearthumb, generally mature after 1 September. They are not so abundant as dotted smartweed and were relatively unimportant in the redwing's diet during the period covered by this study. Rice-cutgrass and waterhemp also were relatively scarce and fall in this category.

Walter's millet occurred in 62 stomachs and formed 11 per cent of the total volume. Large flocks of female redwings were constantly observed feeding in beds of this millet, whereas males rarely were seen there. Seeds of

TABLE 1
FOOD OF 130 RED-WINGED BLACKBIRDS COLLECTED DURING LATE SUMMER IN THE
PATUXENT RIVER MARSH

Food	Per cent of stomachs	Per cent of total volume
PLANTS		
Dotted smartweed	88	38
Wild rice	61	24
Walter's millet	46	11
Corn	26	12
Halberd-leaved tearthumb	18	4
Ragweed	4	1
Panic-grass (<i>Panicum</i> sp.)	3	1
Arrow-leaved tearthumb	3	1
Rice-cutgrass	3	1
Crab-grass	2	Trace
Wheat	1	1
Undetermined native grasses	1	Trace
Water-hemp	Trace	1
INVERTEBRATES		
Beetles, mostly weevils	48	1
Grasshoppers	12	3
Undetermined insects	12	Trace
Caterpillars	3	1
Leaf-hoppers	3	Trace
Spiders	3	Trace
Stink-bugs	2	Trace
Ants	1	Trace
Giant water-bugs	Trace	Trace

this plant occurred in stomachs of 51 of the 67 females, but in only 11 of the 63 males.

Corn appeared in 35, approximately one-fourth, of the stomachs. The presence of this grain in stomachs from birds collected while they were feeding in the marsh supports the field observation that redwings visit the uplands even when smartweeds, wild rice and millets are abundant in the marsh. Further evidence of forays into the uplands is the presence of minor quantities of the following seeds in the stomachs: ragweed (*Ambrosia artemisiifolia*), crab-grass (*Digitaria* sp.), other undetermined native grasses (Gramineae) and wheat (*Triticum aestivum*).

Insects, of which Coleoptera and Orthoptera were the most important, formed only 5 per cent of the total volume of food consumed. Weevils (Curculionidae) occurred in 44 stomachs, and were taken more frequently than other insects, possibly because these slow-moving insects were easily caught.

Other insects taken included caterpillars (Lepidoptera), leaf-hoppers (Homoptera), ants (Hymenoptera) and stink-bugs (Hemiptera). Spiders (Arachnida) occurred in four stomachs. Only one aquatic insect, a giant water-bug (*Belostoma* sp.), was taken.

DISCUSSION

Red-winged Blackbirds spend a great amount of time feeding on marsh foods during late summer, and their depredations on corn fields apparently are reduced. However, the great attraction of wild rice and smartweed results in an influx of vast numbers of redwings to fresh tidal-river marshes, thus creating great potential pressure on adjacent corn fields. The presence of corn in stomachs collected in the marsh, and the obvious devastations in corn fields adjacent to marshes, indicate that the protection to corn is incomplete and that its importance should not be overemphasized.

SUMMARY

During late summer in the Delaware Valley and Chesapeake Bay region, hundreds of thousands of Red-winged Blackbirds feed in wild rice beds of fresh tidal-river marshes. The period during which wild rice seed is available coincides with the ripening period of a part of the corn crop, and there is evidence to indicate that the availability of the wild rice reduces bird feeding pressure on corn in the area. The importance of wild rice and other marsh plants to the redwing during the period when wild rice seed is available was studied further by field observations and by analysis of stomach contents of 130 birds collected in wild rice beds of the Patuxent River in southern Maryland. Seeds of marsh plants formed the bulk of the food of redwings collected. Dotted smartweed, wild rice, and Walter's millet were the most important food plants. Corn was the fourth most important item. It occurred in 35, approximately one-fourth, of the stomachs.

PATUXENT WILDLIFE RESEARCH CENTER, LAUREL, MARYLAND, 2 MARCH 1960